

Naval Sea Systems Command

ERGM

EX171 EXTENDED RANGE GUIDED MUNITION



NAVAL SURFACE WARFARE CENTER



DAHLGREN DIVISION

Naval Surface Fire Support (NSFS)

Before the recent retirement of our battleships, with their awesome 16 inch /50 guns, the Navy could project surface fires up to 22 nmi in support of land warfare. Accuracy and lethal radius combined to yield an effective fire support capability, albeit somewhat range limited. Today's Navy is left with 5 inch /54 guns that have a maximum range of only 13 nmi and very limited effectiveness.

Congress has directed the Navy to develop and deploy appropriate fire support technology. The result has been the establishment of the Naval Surface Fire Support (NSFS) program under the direction of the Naval Sea Systems Command Code PMS-429, with the NSWCDD serving as the Technical Direction Agent (TDA).

The NSFS program's objective is to develop long range guns and missiles designed for maximum reach and effectiveness that can be produced at the lowest possible cost. To accomplish this objective, a development contract for a new munition has been awarded to the Raytheon Systems Company (RSC). NSWCDD, serving as the TDA, will provide engineering assistance, test and evaluation support with range services for a unique gun-launchable munition, the Extended Range Guided Munition (ERGM).

Components of ERGM Program

Basic Subsystems on ERGM

- Navigation and control subsystem in the front
- Payload containing submunitions in the middle
- Solid-propellant rocket motor aft

Improvement of Mk 45 Navy Guns

- Increased muzzle energy is needed to expand the capability of the Mk 45 gun for NSFS. The objective was to increase muzzle energy in the range of 18 MJ from the current 10 MJ
- Increased propellant mass and energy
- Increased brake load capacity and recoil stroke
- Lengthened gun barrel to 62 calibers
- Increased operating pressure

EX-1 submunition payload

- Each ERGM will be able to carry 72 EX-1 submunitions adapted from the Army's M-80 submunition. These submunitions contain a primary impact fuze and a self-destruct backup fuze designed to reduce the risk of hazardous duds on the battlefield.

GPS/INS Guidance System

- Global Positioning System (GPS) guidance system which immediately locks onto four or more GPS satellites to establish position
- Encrypted P(Y) code crystal oscillator which is powered up and calibrated just before firing
- Backup Inertial Navigation System (INS) as alternate means of terminal guidance if GPS is jammed

Future ERGM Developments

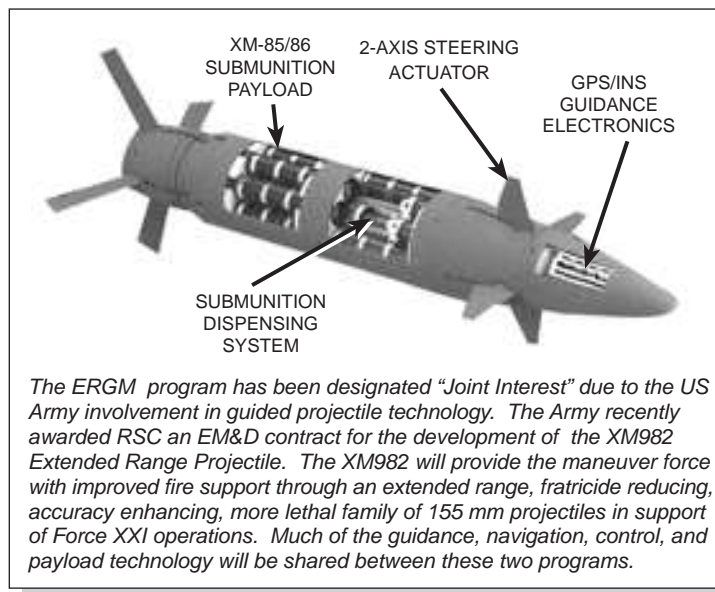
- Incorporation of terminal seeker and unitary warhead to defeat hardened bunkers and moving targets such as tanks and boats
- Development for a larger caliber Naval gun such as a Vertical Gun for Advanced Ships (VGAS) 155 mm gun which would be stowed below the main weather deck and loaded with advanced disk propellant technology and guided munitions like ERGM

Current Development/Testing Schedule

- Land-based flight testing at Yuma Proving Ground and White Sands Missile Range during FY 98, FY99, and FY00
- Operational testing at sea in FY01

Primary Operation Requirements

- Range:
63 nmi when launched with 18 MJ of muzzle energy
- Accuracy:
20m circular error probable (CEP)
- Operational Environment:
all weather, day or night
- Payload:
72 EX-1 dual-purpose submunitions



The ERGM program has been designated "Joint Interest" due to the US Army involvement in guided projectile technology. The Army recently awarded RSC an EM&D contract for the development of the XM982 Extended Range Projectile. The XM982 will provide the maneuver force with improved fire support through an extended range, fratricide reducing, accuracy enhancing, more lethal family of 155 mm projectiles in support of Force XXI operations. Much of the guidance, navigation, control, and payload technology will be shared between these two programs.

NAVAL SEA SYSTEMS COMMAND



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